In The Claim

Claims 1-91 (canceled)

92. (new) A bonding structure, suited for bonding a first electric component and a second electric component, comprising:

a pillar over said first electric component; and

a cap over said pillar, wherein said cap has a greatest transverse dimension less than a transverse dimension of said pillar, said cap suited for being bonded to a pad exposed by an opening in an insulation layer of said second electric component, wherein said greatest transverse dimension of said cap is less than a transverse dimension of said opening, wherein said cap is formed over said pillar before said first electric component is bonded to said second electric component.

93. (new) The structure of claim 92, wherein said pillar comprises copper.

94. (new) The structure of claim 92, wherein said pillar comprises a tin-lead alloy.

95. (new) The structure of claim 92, wherein said pillar comprises gold.

96. (new) The structure of claim 92, wherein said pillar comprises a tin-silver-copper alloy.

97. (new) The structure of claim 92, wherein said cap comprises solder.

98. (new) The structure of claim 92, wherein said cap comprises a tin-lead alloy.

99. (new) The structure of claim 92, wherein said cap comprises tin.

100. (new) The structure of claim 92, wherein said cap comprises a lead-free alloy.

101. (new) The structure of claim 92 further comprising a conductive layer between said pillar and said cap, said pillar having a height greater than that of said conductive layer.

102. (new) The structure of claim 101, wherein said conductive layer has a transverse dimension less than said transverse dimension of said pillar.

103. (new) The structure of claim 101, wherein said conductive layer has a transverse dimension greater than said greatest transverse dimension of said cap.

104. (new) The structure of claim 92, wherein said cap has a melting point lower than that of said pillar.

105. (new) The structure of claim 92 further comprising a metal layer between said pillar and a pad of said first electric component, said pillar having a height greater than that of said metal layer.

104. (new) The structure of claim 103, wherein said metal layer comprises titanium.

105. (new) The structure of claim 103, wherein said metal layer comprises tungsten.

106. (new) The structure of claim 103, wherein said metal layer comprises chromium.

107. (new) The structure of claim 103, wherein said metal layer comprises copper.

108. (new) The structure of claim 103, wherein said metal layer comprises nickel.

109. (new) The structure of claim 103, wherein said metal layer comprises cobalt.

110. (new) The structure of claim 103, wherein said metal layer comprises silver.

111. (new) The structure of claim 103, wherein said metal layer comprises gold.

112. (new) The structure of claim 103, wherein said metal layer comprises tin.

113. (new) The structure of claim 103, wherein said metal layer comprises vanadium.

114. (new) The structure of claim 103, wherein said metal layer comprises palladium.

115. (new) The structure of claim 92, wherein said first electric component comprises a chip.

116. (new) The structure of claim 92, wherein said first electric component comprises a wafer.

117. (new) The structure of claim 92, wherein said second electric component comprises a substrate, and said insulation layer comprises a solder mask layer.

118. (new) A bonding structure, comprising:

a pillar comprising copper and formed using a process comprising electroplating; and

a cap comprising tin and over said pillar, wherein said cap has a greatest transverse dimension less than a transverse dimension of said pillar and has a height less than a height of said pillar.

119. (new) The structure of claim 118, wherein said pillar is over a chip or wafer.

120. (new) The structure of claim 119 further comprising a metal layer between said pillar and said chip or wafer, said pillar having a thickness greater than that of said metal layer.

121. (new) The structure of claim 120, wherein said metal layer comprises titanium, tungsten, chromium, copper, nickel, cobalt, silver, gold, tin, vanadium or palladium.

122. (new) The structure of claim 118, wherein said cap comprises a tin-lead alloy.

123. (new) The structure of claim 118, wherein said cap comprises a lead-free alloy.

124. (new) The structure of claim 118 further comprising a conductive layer between said pillar and said cap, said pillar having a height greater than that of said conductive layer.

125. (new) The structure of claim 124, wherein said conductive layer has a transverse dimension less than said transverse dimension of said pillar.

126. (new) The structure of claim 124, wherein said conductive layer has a transverse dimension greater than said greatest transverse dimension of said cap.

127. (new) The structure of claim 118, wherein said cap has a melting point lower than that of said pillar.

128. (new) A bonding structure, comprising:

a pillar comprising gold; and

a cap comprising tin and over said pillar, wherein said cap has a greatest transverse dimension less than a transverse dimension of said pillar.

129. (new) The structure of claim 128, wherein said pillar is over a chip or wafer.

130. (new) The structure of claim 129 further comprising a metal layer between said pillar and said chip or wafer, said pillar having a thickness greater than that of said metal layer.

131. (new) The structure of claim 130, wherein said metal layer comprises titanium, tungsten, chromium, copper, nickel, cobalt, silver, gold, tin, vanadium or palladium.

132. (new) The structure of claim 128, wherein said cap comprises a tin-lead alloy.

133. (new) The structure of claim 128, wherein said cap comprises a lead-free alloy.

134. (new) The structure of claim 128 further comprising a conductive layer between said pillar and said cap, said pillar having a height greater than that of said conductive layer.

135. (new) The structure of claim 134, wherein said conductive layer has a transverse dimension less than said transverse dimension of said pillar.

136. (new) The structure of claim 136, wherein said conductive layer has a transverse dimension greater than said greatest transverse dimension of said cap.

137. (new) The structure of claim 128, wherein said cap has a melting point lower than that of said pillar.

138. (new) A bonding structure, comprising:

a pillar comprising a tin-lead alloy; and

a cap over said pillar, wherein said cap has a greatest transverse dimension less than a transverse dimension of said pillar.

139. (new) The structure of claim 138, wherein said pillar is over a chip or wafer.

140. (new) The structure of claim 139 further comprising a metal layer between said pillar and said chip or wafer, said pillar having a thickness greater than that of said metal layer.

141. (new) The structure of claim 140, wherein said metal layer comprises titanium, tungsten, chromium, copper, nickel, cobalt, silver, gold, tin, vanadium or palladium.

142. (new) The structure of claim 138, wherein said cap comprises a tin-lead alloy.

143. (new) The structure of claim 138, wherein said cap comprises a tin.

144. (new) The structure of claim 138, wherein said cap comprises a lead-free alloy.

145. (new) The structure of claim 138 further comprising a conductive layer between said pillar and said cap, said pillar having a height greater than that of said conductive layer.

146. (new) The structure of claim 145, wherein said conductive layer has a transverse dimension less than said transverse dimension of said pillar.

147. (new) The structure of claim 145, wherein said conductive layer has a transverse dimension greater than said greatest transverse dimension of said cap.

148. (new) The structure of claim 138, wherein said cap has a melting point lower than that of said pillar.

149. (new) A bonding structure, comprising:

a pillar comprising a tin-silver-copper alloy; and

a cap over said pillar.

150. (new) The structure of claim 149, wherein said pillar is over a chip or wafer.

151. (new) The structure of claim 150 further comprising a metal layer between said pillar and said chip or wafer, said pillar having a thickness greater than that of said metal layer.

152. (new) The structure of claim 151, wherein said metal layer comprises titanium, tungsten, chromium, copper, nickel, cobalt, silver, gold, tin, vanadium or palladium.

153. (new) The structure of claim 149, wherein said cap comprises a tin-lead alloy.

154. (new) The structure of claim 149, wherein said cap comprises a tin.

155. (new) The structure of claim 149, wherein said cap comprises a lead-free alloy.

156. (new) The structure of claim 149, wherein said cap comprises a tin-bismuth alloy.

157. (new) The structure of claim 149 further comprising a conductive layer between said pillar and said cap, said pillar having a height greater than that of said conductive layer.

158. (new) The structure of claim 157, wherein said conductive layer has a transverse dimension less than said transverse dimension of said pillar.

159. (new) The structure of claim 157, wherein said conductive layer has a transverse dimension greater than said greatest transverse dimension of said cap.

160. (new) The structure of claim 149, wherein said cap has a melting point lower than that of said pillar.